OUR VISION:
Department of Civil Engineering, Anna University, shall strive hard to develop and impart technical knowledge and professional skills required for Civil Engineering and Geonformatics Engineering practice through excellence in teaching, research and consultancy to address sustainable infrastructure development needs at local, national and International levels.

OUR MISSION:
Department of Civil Engineering, Anna University shall contribute to technological and development by
1. Providing a firm scientific and technological base in Civil Engineering and Geonformatics Engineering to achieve self-reliance.
2. Providing quality education through innovation in teaching practices at par with global standards.
3. Nurturing leadership and entrepreneurship qualities with ethical values.
4. Developing and disseminating latest knowledge and technologies in emerging areas of Civil Engineering and Geonformatics Engineering.
5. Sharing intellectual resources and infrastructure facilities through collaborative partnership.
6. Ensuring supporting conditions for enhancing the employability skills.
PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)
The Programme B.E. Geoinformatics will help to

PEO1 prepare the students for successful careers in Geospatial and Information Technology industries that meet the global needs.

PEO2 develop the professional ability of the students in data collection, analysis and synthesis for solving real world problems.

PEO3 inculcate entrepreneurship skills, leadership qualities and to work in teams on trans disciplinary projects.

PEO4 develop required skills in the mathematical, scientific and engineering fundamentals necessary to provide robust solutions using modern instrumentation and software tools.

PEO5 provide opportunity to imbibe requisite qualities to practice the geospatial technology with professional ethics.

PROGRAMME OUTCOMES (POs)
Graduates of B.E. Geoinformatics students will be able to

PO1 Knowledge of Engineering Sciences Apply the Knowledge of mathematics, science and Engineering fundamentals in the field of Geoinformatics Engineering.

PO2 Problem Analysis Identify, formulate and provide solution for multi-disciplinary Problems using Geoinformatics.

PO3 Design / development of Solutions design and evaluate solutions for efficient management of natural, socio-economic resources through intervention of Geoinformatics tools.

PO4 Investigations Conduct investigations of geoinformatics engineering problems including literature survey, appropriate methodology, analysis, interpretation of data and synthesis of information to provide valid conclusion.

PO5 Use of Modern Technology Design, use and apply modern technology, tools and software to address and solve the problems with due understanding of the limitations.

PO6 Engineer and Society Demonstrate understanding of the societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to Geo Informatics Engineering Practice.

PO7 Environment and Sustainability Understand the Socio economic impact of Geo Informatics Engineering solutions for sustainable development.

PO8 Ethics Understand the commitment to professional ethics and responsibilities of Geo Informatics Engineers and to contribute to the comprehensive societal development.
PO9  Individual and Team work  Function effectively as an individual and as member or leader in diverse teams and in multi-disciplinary settings and demonstrating a capacity for self-management and teamwork, decision-making based on open-mindedness, objectivity and rational analysis.

PO10  Communication  Communicate effectively with the engineering community and also with society at large, and write reports and make effective presentations.

PO11  Project Management and Finance  Demonstrate Knowledge of management and business practices, such as risk and change management and understand their limitations

PO12  Life Long Learning  Develop ability to engage in independent and life-long learning to improve competence by critical examination of the outcomes of one’s actions in addressing Geo Informatics Engineering issues and learning from corrective and preventive measures.

PROGRAMME SPECIFIC OUTCOMES (PSOs)

Graduates of B.E. Geoinformatics students will be able to

PSO1  Knowledge of Geoinformatics discipline  Demonstrate in-depth knowledge of Geoinformatics engineering discipline with an ability to evaluate, analyse and synthesise existing and new knowledge.

PSO2  Critical analysis of Geoinformatics Engineering problems and innovations  Critically analyze complex Geoinformatics problems and apply independent judgment for synthesizing information and make innovative advances in a theoretical, practical policy context.

PSO3  Conceptualization and evaluation of engineering solutions to Geoinformatics engineering issues.  Conceptualize and solve Geoinformatics engineering problems, evaluate potential solutions and arrive at technically feasible, economically viable and environmentally sound solutions with due consideration of health, safety and socio cultural factors.

PEO / PO & PSO MAPPING:

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### Semester I

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*Skill Based Course

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TOTAL 15 2 8 25 21

*Skill Based Course

* NCC Credit Course level 1 is offered for NCC students only. The grades earned by the students will be recorded in the Mark Sheet, however the same shall not be considered for the computation of CGPA
UNIT I  BASICS OF COMMUNICATION
Listening – Telephone conversation & Writing message, gap filling; Reading – Telephone message, bio-note; Writing – Personal profile; Grammar – Simple present tense, Present continuous tense, Asking questions (wh-questions); Vocabulary – One word substitution, Synonyms

UNIT II  NARRATION
Listening – Travel podcast / Watching a travel documentary; Reading – An excerpt from a travelogue, Newspaper Report; Writing – Narrative (Event, personal experience etc.); Grammar – Subject – verb agreement, Simple past, Past continuous Tenses; Vocabulary – Antonyms, Word formation (Prefix and Suffix).

UNIT III  DESCRIPTION
Listening – Conversation, Radio/TV advertisement; Reading – A tourist brochure and planning an itinerary, descriptive article / excerpt from literature; Writing – Definitions, Descriptive writing, Checklists; Grammar – Future tense, Perfect tenses, Preposition; Vocabulary – Adjectives and Adverbs

UNIT IV  CLASSIFICATION
Listening – Announcements and filling a table; Reading – An article, social media posts and classifying (channel conversion – text to table); Writing – Note making, Note taking and Summarising, a classification paragraph; Grammar – Connectives, Transition words; Vocabulary – Contextual vocabulary, Words used both as noun and verb, Classification related words.

UNIT V  EXPRESSION OF VIEWS
Listening – Debate / Discussion; Reading – Formal letters, Letters to Editor, Opinion articles / Blogs; Writing – Letter writing / Email writing (Enquiry / Permission, Letter to Editor); Grammar – Question tags, Indirect questions, Yes / No questions; Vocabulary – Compound words, Phrasal verbs.

Assessment
Two Written Assessments: 35% weightage each
Assignment: 30% weightage
Designing a tourist brochure / Writing an opinion article / Making a travel podcast

End Semester Exam: 3-hour written exam

TOTAL: 45 PERIODS

COURSE OUTCOMES
At the end of the course, students will be able to
CO1: Use grammar and vocabulary suitable for general context.
CO2: Comprehend the nuances of spoken and written communication.
CO3: Use descriptive and analytical words, phrases, and sentence structures in written communication.
CO4: Read different types of texts and comprehend their denotative and connotative meanings.
CO5: Write different types of texts using appropriate formats.

TEXT BOOKS:
1. “English for Engineers and Technologists” Volume I by Orient Blackswan, 2022

REFERENCES
4. www.uefap.com

CO-PO & PSO MAPPING

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1-low, 2-medium, 3-high

MA3151 MATRICES AND CALCULUS

UNIT I MATRICES
Eigen values and Eigen vectors of a real matrix – Properties of Eigen values - Cayley-Hamilton theorem (excluding proof) – Diagonalization of matrices - Reduction of Quadratic form to canonical form by using orthogonal transformation - Nature of a Quadratic form.

UNIT II FUNCTIONS OF SEVERAL VARIABLES

UNIT III INTEGRAL CALCULUS
Improper integrals of the first and second kind and their convergence – Differentiation under integrals - Evaluation of integrals involving a parameter by Leibnitz rule – Beta and Gamma functions-Properties – Evaluation of integrals by using Beta and Gamma functions – Error functions.

UNIT IV MULTIPLE INTEGRALS

UNIT V VECTOR CALCULUS
Gradient of a scalar field, directional derivative – Divergence and Curl – Solenoidal and Irrotational vector fields - Line integrals over a plane curve - Surface integrals – Area of a curved surface – Volume Integral - Green’s theorem, Stoke’s and Gauss divergence theorems – Verification and applications in evaluating line, surface and volume integrals.

TOTAL: 60 PERIODS

COURSE OUTCOMES:
At the end of the course, the students will be able to:
CO1: Use the matrix algebra methods for solving practical problems.
CO2: Use differential calculus ideas on several variable functions.
CO3: Apply different methods of integration in solving practical problems by using Beta and Gamma functions.
CO4: Apply multiple integral ideas in solving areas and volumes problems.
CO5: Apply the concept of vectors in solving practical problems.

TEXT BOOKS:

REFERENCES:

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PH3151 ENGINEERING PHYSICS

UNIT I MECHANICS OF MATERIALS

UNIT II OSCILLATIONS, SOUND AND THERMAL PHYSICS

UNIT III OPTICS AND LASERS
Interference - Thin film interference - Air wedge- Applications -Interferometers–Michelson Interferometer — Diffraction - CD as diffraction grating – Diffraction by crystals -Polarization -
UNIT IV QUANTUM MECHANICS

UNIT V CRYSTAL PHYSICS

COURSE OUTCOMES:
After completion of this course, the students shall be
CO1: Understand the important mechanical properties of materials
CO2: Express the knowledge of oscillations, sound and applications of Thermal Physics
CO3: Know the basics of optics and lasers and its applications
CO4: Understand the basics and importance of quantum physics.
CO5: Understand the significance of crystal physics.

TEXT BOOKS:

REFERENCES:

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UNIT I  POLYMER CHEMISTRY  9

UNIT II  NANOCHEMISTRY  9

UNIT III  CORROSION SCIENCE  9

UNIT IV  ENERGY SOURCES  9
Batteries - Characteristics - types of batteries – primary battery (dry cell), secondary battery (lead acid, lithium-ion-battery)- emerging batteries – nickel-metal hydride battery, aluminum air battery, batteries for automobiles and satellites - Fuel cells (Types) – H₂-O₂ fuel cell - Supercapacitors- Types and Applications, Renewable Energy: Solar- solar cells, DSSC

UNIT V  WATER TECHNOLOGY  9

TOTAL: 45 PERIODS

COURSE OUTCOMES:
CO1: To recognize and apply basic knowledge on different types of polymeric materials, their general preparation methods and applications to futuristic material fabrication needs.
CO2: To identify and apply basic concepts of nanoscience and nanotechnology in designing the synthesis of nanomaterials for engineering and technology applications.
CO3: To recognize and apply basic knowledge on suitable corrosion protection technique for practical problems.
CO4: To recognize different storage devices and apply them for suitable applications in energy sectors.
CO5: To demonstrate the knowledge of water and their quality in using at different industries.
TEXT BOOKS:

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GE3155 ENGINEERING DRAWING

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CONCEPTS AND CONVENTIONS (NOT FOR EXAMINATION) 2
Importance of graphics in engineering applications – Use of drafting instruments – BIS conventions and specifications – Size, layout and folding of drawing sheets – Lettering and dimensioning.

UNIT I PLANE CURVES 4 + 12
Basic Geometrical constructions, Curves used in engineering practices: Conics — Construction of ellipse, parabola and hyperbola by eccentricity method — Construction of cycloid — construction of involutes of square and circle — Drawing of tangents and normal to the above curves.

UNIT II PROJECTION OF POINTS, LINES AND PLANE SURFACE 6 + 12
Orthographic projection- Principal planes - First angle projection - projection of points. Projection of straight lines (only First angle projections) inclined to both the principal planes - Determination of true lengths and true inclinations by rotating line method and traces. Projection of planes (polygonal and circular surfaces) inclined to both the principal planes by rotating object method.

UNIT III PROJECTION OF SOLIDS AND FREEHAND SKETCHING 6 + 12
Projection of simple solids like prisms, pyramids, cylinder, and cone when the axis is inclined to both the principal planes by rotating object method. Visualization concepts and Free Hand sketching: Visualization principles —Representation of Three-Dimensional objects — Layout of views- Freehand sketching of multiple views from pictorial views of objects. Practicing three dimensional modeling of simple objects by CAD Software (Not for examination).

UNIT IV PROJECTION OF SECTIONED SOLIDS AND DEVELOPMENT OF SURFACES 6 + 12
Sectioning of simple solids like prisms, pyramids, cylinder, and cone in simple vertical position when the cutting plane is inclined to the one of the principal planes and perpendicular to the other — obtaining true shape of section. Development of lateral surfaces of simple and sectioned solids — Prisms, pyramids cylinders and cones. Development of lateral surfaces of solids with cut-outs
and holes. Practicing three dimensional modeling of simple truncated objects by CAD Software (Not for examination).

UNIT V ISOMETRIC AND PERSPECTIVE PROJECTIONS 6 + 12 Principles of isometric projection — isometric scale - Isometric projections of simple solids and truncated solids - Prisms, pyramids, cylinders, cones- combination of two solid objects in simple vertical positions - Perspective projection of simple solids-Prisms, pyramids, cone and cylinders by visual ray method. Creating isometric model of simple objects from orthographic projections using CAD software (Not for examination).

TOTAL : 90 PERIODS

COURSE OUTCOMES:
On successful completion of this course, the student will be able to
CO1. Draw conic curves, cycloids and involutes
CO2. Draw orthographic projections of points, lines and planes
CO3. Draw orthographic projections and free hand sketches of solids
CO4. Draw sectional views of the objects and development of surfaces.
CO5. Draw isometric and perspective views of simple solids

TEXTBOOKS:

REFERENCES:

Publication of Bureau of Indian Standards:

Special points applicable to University Examinations on Engineering Drawing:
1. There will be five questions, each of either or type covering all units of the syllabus.
2. All questions will carry equal marks of 20 each making a total of 100.
3. The answer paper shall consist of drawing sheets only in the size of A3.
4. The students will be permitted to use appropriate scale to fit the solution within A3 size.
5. The examination will be conducted in appropriate sessions on the same day.
CO-PO & PSO MAPPING

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GE3154

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12
### TEXT-CUM-REFERENCE BOOKS

1. Social Life of Tamils (Dr. K.K. Pillay) A joint publication of TNTB & ESC and RMRL – (in print)
2. Social Life of the Tamils - The Classical Period (Dr. S. Singaravelu) (Published by: International Institute of Tamil Studies).
3. Historical Heritage of the Tamils (Dr. S. V. Subatamanian, Dr. K. D. Thirunavukkarasu) (Published by: International Institute of Tamil Studies).
4. The Contributions of the Tamils to Indian Culture (Dr. M. Valarmathi) (Published by: International Institute of Tamil Studies.)
5. Keeladi - 'Sangam City Civilization on the banks of river Vaigai' (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)
6. Studies in the History of India with Special Reference to Tamil Nadu (Dr. K. K. Pillay) (Published by: The Author)
7. Porunai Civilization (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)

### GE3154 HERITAGE OF TAMILS

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<th>UNIT I</th>
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<tr>
<td>Hero stone to modern sculpture - Bronze icons - Tribes and their handicrafts - Art of temple car making - - Massive Terracotta sculptures, Village deities, Thiruvalluvar Statue at Kanyakumari, Making of musical instruments - Mridhangam, Parai, Veenai, Yazh and Nadhaswaram - Role of Temples in Social and Economic Life of Tamils.</td>
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<td>Therukoothu, Karagattam, Villu Pattu, Kaniyan Koothu, Oyillattam, Leather puppetry, Silambattam, Valari, Tiger dance - Sports and Games of Tamils.</td>
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<td>Flora and Fauna of Tamils &amp; Aham and Puram Concept from Tholkappiyam and Sangam Literature - Aram Concept of Tamils - Education and Literacy during Sangam Age - Ancient Cities</td>
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and Ports of Sangam Age - Export and Import during Sangam Age - Overseas Conquest of Cholas.

**UNIT V CONTRIBUTION OF TAMILS TO INDIAN NATIONAL MOVEMENT AND INDIAN CULTURE**

Contribution of Tamils to Indian Freedom Struggle - The Cultural Influence of Tamils over the other parts of India – Self-Respect Movement - Role of Siddha Medicine in Indigenous Systems of Medicine – Inscriptions & Manuscripts – Print History of Tamil Books.

**TOTAL : 15 PERIODS**

**TEXT-CUM-REFERENCE BOOKS**

1. கி.எஸ். பிள்ளையார் - கிராமகல் பராயனம் - தெலுங்கு. பிள்ளையார் (தமிழில்: கிராமகல் பராயனம் கூறுகறிவு பாண்டிகள் குற்றம்).
2. கி.எஸ். பிள்ளையார் - கிராமகல் பராயனம் (தமிழில்: பிள்ளையார்).
3. கி.எஸ். பிள்ளையார் - கிராமகல் பராயனம் கூறுகறிவு குற்றம் குற்றக சுருக்கம் (தமிழில்: பாண்டிகள் குற்றம் குற்றக சுருக்கம்).
4. பிள்ளையார் - கிராமகல் பராயனம். (தமிழில்: பிள்ளையார்).
5. Social Life of Tamils (Dr.K.K.Pillay) A joint publication of TNTB & ESC and RMRL – (in print)
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**GE3161 ENGINEERING PRACTICES LABORATORY**

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**GROUP – A (CIVIL & ELECTRICAL)**

**1. CIVIL ENGINEERING PRACTICES**

**PLUMBING:**

Basic pipe connections involving the fittings like valves, taps, coupling, unions, reducers, elbows and other components used in household fittings. Preparation of plumbing line sketches.

- a) Laying pipe connection to the suction side of a pump
- b) Laying pipe connection to the delivery side of a pump.
- c) Practice in connecting pipes of different materials: Metal, plastic and flexible pipes used in household appliances.

**WOOD WORK:**

Sawing, planing and making joints like T-Joint, Mortise and Tenon joint and Dovetail joint.

**STUDY EXCERCISES**

- a) Study of joints in door panels and wooden furniture
b) Study of common industrial trusses using models.

2. ELECTRICAL ENGINEERING PRACTICES 15
   a) Basic household wiring using Switches, Fuse, Indicator and Lamp etc.,
   b) Stair case light wiring
   c) Tube – light wiring
   d) Preparation of wiring diagrams for a given situation.
   e) Study of Iron-Box, Fan Regulator and Emergency Lamp

GROUP – B (MECHANICAL AND ELECTRONICS)

3. MECHANICAL ENGINEERING PRACTICES 15

WELDING
   a) Arc welding of Butt Joints, Lap Joints, and Tee Joints
   b) Gas welding demonstration.
   c) Basic Machining - Simple turning, drilling and tapping operations.
   d) Study and assembling of the following: Centrifugal pump, Mixer, Air-conditioner

SHEET METAL PRACTICE: Making of a square tray

DEMONSTRATION ON FOUNDRY OPERATIONS.

4. ELECTRONIC ENGINEERING PRACTICES 15
   a) Soldering simple electronic circuits and checking continuity.
   b) Assembling electronic components on a small PCB and Testing.
   c) Study of Telephone, FM radio and Low Voltage Power supplies.

TOTAL: 60 PERIODS

COURSE OUTCOMES:
CO1. Ability to make common joints in carpentry and pipe connections with fittings used in plumbing works.
CO2. Ability to do electrical wiring for household applications.
CO3. Ability to weld the steel the structures and soldering of electronical connections and testing of PCBs

CO-PO & PSO MAPPING

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1-low, 2-medium, 3-high

CY3161 CHEMISTRY LABORATORY L T P C
(Minimum of 8 experiments to be conducted) 0 0 2 1

LIST OF EXPERIMENTS:
1. Estimation of HCl using Na₂CO₃ as primary standard
2. Determination of alkalinity in water sample.
3. Determination of hardness of water by EDTA method.
4. Determination of DO content of water sample by Winkler’s method.
5. Determination of chloride content of water sample by Argentometric method.
6. Estimation of copper content of the given solution by Iodometry.
7. Determination of strength of given hydrochloric acid using pH meter.
8. Determination of strength of acids in a mixture of acids using conductivity meter.
9. Estimation of iron content of the given solution using potentiometer.
10. Estimation of iron content of the water sample using spectrophotometer (1, 10-
Phenanthroline/thiocyanate method).
11. Estimation of sodium and potassium present in water using flame photometer.
13. Determination of Glass transition temperature of a polymer
14. Phase change in a solid.
15. Corrosion experiment-weight loss method.

TOTAL: 30 PERIODS

COURSE OUTCOMES:
After completion of the laboratory course, the student will be able to –

CO1: analyse the water quality parameters for domestic and industrial purposes.

CO2: determine the amount of metal ions by spectroscopic techniques

CO3: select a suitable polymer for industrial applications.

CO4: quantitatively analyse the impurities in solution by electroanalytical techniques.

CO5: predict the choice of metals for industrial purposes using corrosion studies.

TEXTBOOKS:

CO - PO Mapping

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GE3162 ENGLISH LABORATORY – I

UNIT I SELF-INTRODUCTION
Introducing oneself; Telephone conversation, Relaying telephone message – Role play

UNIT II NARRATION
Narrating one’s personal experience in front of a group (formal and informal context)
Ex.: First day in college / vacation / first achievement etc.

UNIT III CONVERSATION
Making conversation – formal and informal – Turn taking and Turn giving – Small talk

UNIT IV SHORT SPEECH
Giving short speeches on topics like College Clubs and their activities in the college / Campus Facilities / native place and its major attractions.

UNIT V   DISCUSSION  
Taking part in a group discussion on general topics – Debating on topics of interest and relevance.

Assessment 
Internals – 100% 
Short Speeches 
Group discussion

TOTAL : 30 PERIODS

COURSE OUTCOMES
At the end of the course, students will be able to
CO1. Communicate effectively in formal and informal contexts
CO2. Converse appropriately and confidently with different people
CO3. Express their opinions assertively in group discussions

CO-PO & PSO MAPPING

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HS3251 ENGLISH FOR COMMUNICATION – II  
UNIT I  CAUSE AND EFFECT  
Listening – Radio / TV / Podcast Interview (survivors tale) and framing a set of instructions/ Do’s and Don’ts; Reading – Excerpts of Literature (short stories), Journal articles on issues like Global warming; Writing - Instructions; Official letter / email (Request for internship / Industrial visit); Grammar – If conditionals, Imperatives; Vocabulary -- Cause and effect expressions, Idiom

UNIT II  COMPARE AND CONTRAST  
Listening – Product reviews and gap fill exercises, Short Talks (like TED Talks) for specific information; Reading – Graphical content (table / chart / graph) and making inferences; Writing – Compare and Contrast Essay; Grammar – Degrees of Comparison; Mixed Tenses; Vocabulary – Order of Adjectives, Transition words.

UNIT III  PROBLEM AND SOLUTION  
Listening – Group discussion (case study); Reading – Visual content (Pictures on social issues / natural disasters) for comprehension; Editorial; Writing Picture description; Problem and Solution Essay; Grammar – Modal verbs; Relative pronoun; Vocabulary – Negative prefixes, Signal words for problem and solution.
UNIT IV  REPORTING  9
Listening – Oral news report; Reading – Newspaper report on survey findings – Writing – Survey report, Making recommendations; Grammar – Active and passive voice, Direct and Indirect speech; Vocabulary – Reporting verbs, Numerical adjectives.

UNIT V  PRESENTATION  9
Listening – Job interview, Telephone interview; Reading - Job advertisement and company profile and making inferences; Writing – Job application (cover letter and CV) Grammar – Prepositional phrases; Vocabulary – Fixed expressions, Collocations.
Assessment
Two Written Assessments: 35% weightage each
Assignment: 30% weightage
Conducting a survey on specific topic and write a final survey report.
End Semester Exam: 3-hour written exam

TOTAL : 45 PERIODS

COURSE OUTCOMES
On completion of the course, the students will be able to:
CO1. Listen effectively to various oral forms of conversation, lectures, discussion and understand the main gist of the content.
CO2. Communicate effectively in formal and informal context.
CO3. Read and comprehend technical texts effortlessly.
CO4. Write reports and job application for internship or placement.
CO5. Learn to use language effectively in a professional context.

TEXT BOOKS
1. “English for Engineers and Technologists” Volume 2 by Orient Blackswan, 2022

REFERENCES
4. www.uefap.com

CO-PO & PSO MAPPING

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UNIT I           ORDINARY DIFFERENTIAL EQUATIONS
Homogeneous linear ordinary differential equations of second order, linearity principle, general
solution- Particular integral - Operator method - Solution by variation of parameters - Method of
undetermined coefficients - Homogenous equations of Euler–Cauchy and Legendre’s type –
System of simultaneous linear differential equations with constant coefficients.

UNIT II        LAPLACE TRANSFORMS
Existence theorem - Transform of standard functions – Transform of Unit step function and Dirac
delta function – Basic properties - Shifting theorems - Transforms of derivatives and integrals –
Transform of periodic functions - Initial and Final value theorem - Inverse Laplace - Convolution
theorem (without proof) – Solving Initial value problems by using Laplace Transform techniques.

UNIT III      FOURIER SERIES
Dirichlet’s conditions – General Fourier series – Odd and even functions – Half-range Sine and
Cosine series – Complex form of Fourier series – Parseval’s identity – Harmonic Analysis.

UNIT IV        FOURIER TRANSFORMS
Fourier integral theorem – Fourier transform pair - Fourier sine and cosine transforms – Properties
– Transform of elementary functions - Convolution theorem (without proof) – Parsevals’s identity.

UNIT V            Z – TRANSFORM AND DIFFERENCE EQUATIONS
Z-transform – Elementary properties – Inverse Z-transform – Convolution theorem – Initial and
final value theorems – Formation of difference equation – Solution of difference equation using Z -
transform.

COURSE OUTCOMES:
At the end of the course, the students will be able to:
CO1: Solve higher order ordinary differential equations which arise in engineering applications.
CO2: Apply Laplace transform techniques in solving linear differential equations.
CO3: Apply Fourier series techniques in engineering applications.
CO4: Understand the Fourier transforms techniques in solving engineering problems.
CO5: Understand the Z-transforms techniques in solving difference equations.

TEXT BOOKS:
   2017.

REFERENCES:
   Reprint, 2008.
   Reprint, Delhi, 2009.
   New Delhi, 2010.
CO-PO Mapping

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1-low, 2-medium, 3-high

PH3201 PHYSICS FOR GEO-INFORMATICS ENGINEERING LTPC 3 0 0 3

UNIT I INTRODUCTION TO SPACE WEATHER
Sun Heliosphere: corona and the solar wind, interplanetary magnetic field coronal mass ejections, cosmic rays - Earth’s Space environment: dipole magnetic field, the structure of the inner magnetosphere, interaction of solar wind and magnetosphere, magnetic reconnection, magnetotail, plasma sheet convection - Earth’s upper atmosphere: thermosphere, ionosphere, structure and variation, aurora - Radiation impacts on satellites – Radio communication and navigation impacts

UNIT II HEAT TRANSFER
Modes of heat transfer- Conduction, Convection and Radiation – Importance of material properties in heat transfer — Thermal conductivity - Specific heat capacity - Steady state conduction through constant area - Principle of convection- Free & forced convective heat transfer- Radiation heat transfer-black and grey body radiation.

UNIT III OPTICS FOR REMOTE SENSING

UNIT IV GRAVITATION
Newton’s law of gravitation - Gravitational field and potential - Determination of gravity - Variation of acceleration due to gravity of the earth with depth, altitude and rotation of the earth — Refraction - Diffraction - Fresnel theory, Circular diffraction gravity, Polarization double distraction – Escape velocity - Kepler’s law of planetary motion - Doppler effect.

UNIT V ELECTRO-OPTIC SENSORS
Photomultipliers, photoresistors, photodiodes, nonselective detectors - Optical receivers, PIN and APD, optical preamplifiers - Detectors: basic detector mechanisms, noise in detectors. thermal and photoemissive detectors, photoconductive and photovoltaic detectors, performance limits, photographic sensitivity, time and frequency response-hybrid photodetectors - Imaging detectors - eye and vision - photographic film - Camera tubes - Solid state arrays - video detector electronics, detector interfacing.

COURSE OUTCOMES:
• On completion of the course, the student is expected to be able to
CO1 Acquire knowledge in specialty physics by further exploring space weather and the effect of those environments on satellites.
CO2 Implement the heat transfer principles in remote sensing.
CO3 understand the basic optical principles
CO4 Understand the fundamentals of gravitation.

TOTAL: 45 PERIODS
CO5 Gain knowledge about different types of electro-optic sensors and its detection mechanism

TEXTBOOKS:

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1-low, 2-medium, 3-high

GE3153 PROGRAMMING IN C

UNIT I - BASICS OF C PROGRAMMING

Introduction to programming paradigms — Structure of C program - C programming: Data Types - Constants - Keywords - Operators: Precedence and Associativity - Expressions - Input/Output statements, Assignment statements - Decision making statements - Switch statement.

PRACTICALS:
- Designing programs with algorithms/flowchart
- Programs for i/o operations with different data types
- Programs using various operators
- Programs using decision making and branching statements

UNIT II – LOOP CONTROL STATEMENTS AND ARRAYS

Iteration statements: For, while, Do-while statements, nested loops, break & continue statements - Introduction to Arrays: Declaration, Initialization - One dimensional array - Two dimensional arrays – Searching and sorting in Arrays – Strings – string handling functions - array of strings
PRACTICALS:
- Programs using for, while, do-while loops and nested loops.
- Programs using arrays and operations on arrays.
- Programs implementing searching and sorting using arrays
- Programs implementing string operations on arrays

UNIT III - FUNCTIONS AND POINTERS 6+12
Modular programming - Function prototype, function definition, function call, Built-in functions – Recursion – Recursive functions - Pointers - Pointer increment, Pointer arithmetic - Parameter passing: Pass by value, Pass by reference, pointer and arrays, dynamic memory allocation with malloc/calloc

PRACTICALS:
- Programs using functions
- Programs using recursion
- Programs using pointers & strings with pointers
- Programs using Dynamic Memory Allocation

UNIT IV - STRUCTURES AND UNION 6+12
Storage class, Structure and union, Features of structures, Declaration and initialization of structures, array of structures, Pointer to structure, structure and functions, typedef , bit fields , enumerated data types, Union.

PRACTICALS:
- Programs using Structures
- Programs using Unions
- Programs using pointers to structures and self-referential structures

UNIT V – MACROS AND FILE PROCESSING 6+12

PRACTICALS:
- Programs using pre-processor directives & macros
- Programs to handle file operations
- Programs to handle file with structure

COURSE OUTCOMES:
Upon completion of the course, the students will be able to
CO1: Write simple C programs using basic constructs.
CO2: Design searching and sorting algorithms using arrays and strings.
CO3: Implement modular applications using Functions and pointers.
CO4: Develop and execute applications using structures and Unions.
CO5: Solve real world problem using files.

TOTAL PERIODS: 90 (30+60)

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1 - low, 2 - medium, 3 - high

GE3151 ENGINEERING MECHANICS

UNIT I STATICS OF PARTICLES 9+3

UNIT II EQUILIBRIUM OF RIGID BODIES AND TRUSSES 9+3

UNIT III DISTRIBUTED FORCES 9+3
Centroids of lines and areas – symmetrical and unsymmetrical shapes, Determination of Centroids by Integration, Theorems of Pappus-Guldinus, Distributed Loads on Beams, Centre of Gravity of a Three-Dimensional Body, Centroid of a Volume, Composite Bodies, Determination of Centroids of Volumes by Integration.
Moments of Inertia of Areas and Mass - Determination of the Moment of Inertia of an Area by Integration, Polar Moment of Inertia, Radius of Gyration of an Area, Parallel-Axis Theorem, Moments of Inertia of Composite Areas, Moments of Inertia of a Mass - Moments of Inertia of Thin Plates, Determination of the Moment of Inertia of a Three-Dimensional Body by Integration.

UNIT IV FRICTION AND WORK PRINCIPLES 9+3

UNIT V          DYNAMICS OF PARTICLES AND RIGID BODIES          9+3

TOTAL : 60 PERIODS

COURSE OUTCOMES: Upon completion of this course, the students will be able to:

CO1 To determine the resultant forces acting on a particle in 2D and 3D and to apply methods of equilibrium on a particle in 2D and 3D.
CO2 Evaluate the reaction forces for bodies under equilibrium, to determine moment of a force, moment of a couple, to resolve force into a force-couple system and to analyze trusses.
CO3 Assess the centroids of 2D sections / center of gravity of volumes and to calculate area moments of inertia for the sections and mass moment of inertia of solids.
CO4 Evaluate the frictional forces acting at the contact surfaces of various engineering systems and apply the work-energy principles on a particle. evaluate the kinetic and kinematic parameters of a particle.
CO5 Determine kinetic and kinematic parameters of the rigid bodies subjected to concurrent coplanar forces.

TEXTBOOKS:

REFERENCES:

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1-low, 2-medium, 3-high
### NCC Credit Course Level 1*

**NX3251** *(ARMY WING) NCC Credit Course Level - I*

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#### NATIONAL INTEGRATION AND AWARENESS

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#### SOCIAL SERVICE AND COMMUNITY DEVELOPMENT

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**TOTAL : 30 PERIODS**

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**NX3252** *(NAVAL WING) NCC Credit Course Level - I*

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#### NATIONAL INTEGRATION AND AWARENESS

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### PERSONALITY DEVELOPMENT  7
- PD 1  Self-Awareness, Empathy, Critical & Creative Thinking, Decision Making and Problem Solving  2
- PD 2  Communication Skills  3
- PD 3  Group Discussion: Stress & Emotions  2

### LEADERSHIP  5
- L 1  Leadership Capsule: Traits, Indicators, Motivation, Moral Values, Honour Code  3
- L 2  Case Studies: Shivaji, Jhasi Ki Rani  2

### SOCIAL SERVICE AND COMMUNITY DEVELOPMENT  8
- SS 1  Basics, Rural Development Programmes, NGOs, Contribution of Youth  3
- SS 4  Protection of Children and Women Safety  1
- SS 5  Road / Rail Travel Safety  1
- SS 6  New Initiatives  2
- SS 7  Cyber and Mobile Security Awareness  1

**TOTAL : 30 PERIODS**
TEXT-CUM-REFERENCE BOOKS

2. Dravidian Linguistics - Tamil. (Society: Tamil Society). (In print)
3. Dravidian Linguistics - Tamil. (Society: Tamil Society) (In print)
4. Dravidian Linguistics - Tamil. (Society: Tamil Society) (In print)
5. Social Life of Tamils (Dr.K.K.Pillay) A joint publication of TNTB & ESC and RMRL - (in print)
6. Social Life of the Tamils - The Classical Period (Dr.S.Singaravelu) (Published by: International Institute of Tamil Studies).
7. Historical Heritage of the Tamils (Dr.S.V.Subatamanian, Dr.K.D. Thirunavukkarasu) (Published by: International Institute of Tamil Studies).
8. The Contributions of the Tamils to Indian Culture (Dr.M.Valarmathi) (Published by: International Institute of Tamil Studies.)
9. Keeladi - ‘Sangam City Civilization on the banks of river Vaigai’ (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)
10. Studies in the History of India with Special Reference to Tamil Nadu (Dr.K.K.Pillay) (Published by: The Author)
11. Porunai Civilization (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)

GE3251 TAMILS AND TECHNOLOGY L T P C

UNIT I WEAVING AND CERAMIC TECHNOLOGY 1 0 0 1
Weaving Industry during Sangam Age – Ceramic technology – Black and Red Ware Potteries (BRW) – Graffiti on Potteries.

UNIT II DESIGN AND CONSTRUCTION TECHNOLOGY 3
Designing and Structural construction House & Designs in household materials during Sangam Age - Building materials and Hero stones of Sangam age – Details of Stage Constructions in Silappathikaram - Sculptures and Temples of Mamallapuram - Great Temples of Cholas and other worship places - Temples of Nayaka Period - Type study (Madurai Meenakshi Temple)- Thirumalai Nayakar Mahal - Chetti Nadu Houses, Indo - Saracenic architecture at Madras during British Period.

UNIT III MANUFACTURING TECHNOLOGY 3

UNIT IV AGRICULTURE AND IRRIGATION TECHNOLOGY 3
Dam, Tank, ponds, Sluice, Significance of Kumizhi Thoompu of Chola Period, Animal Husbandry - Wells designed for cattle use - Agriculture and Agro Processing - Knowledge of Sea - Fisheries – Pearl - Conche diving - Ancient Knowledge of Ocean - Knowledge Specific Society.

UNIT V SCIENTIFIC TAMIL & TAMIL COMPUTING 3

TOTAL : 15 PERIODS
TEXT-CUM-REFERENCE BOOKS

1. Social Life of Tamils - The Classical Period (Dr.S.Singaravelu) (Published by: International Institute of Tamil Studies).
2. The Contributions of the Tamils to Indian Culture (Dr.M.Valarmathi) (Published by: International Institute of Tamil Studies.)
3. Keeladi - ‘Sangam City Civilization on the banks of river Vaigai’ (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)
4. Studies in the History of India with Special Reference to Tamil Nadu (Dr.K.K.Pillay) (Published by: The Author)
5. Porunai Civilization (Jointly Published by: Department of Archaeology & Tamil Nadu Text Book and Educational Services Corporation, Tamil Nadu)

PH3161

PHYSICS LABORATORY

Any SEVEN Experiments

1. Torsional Pendulum-Determination of rigidity modulus of wire and moment of inertia of the disc
2. Non-uniform bending - Determination of Young’s modulus of the material of the beam.
3. Uniform bending – Determination of Young’s modulus of the material of the beam.
4. Lee’s Disc Experiment - Determination of thermal conductivity of bad conductors.
5. Viscosity of Liquids.
6. Acoustic grating-Determination of the velocity of ultrasonic waves in liquids.
7. Ultrasonic interferometer – determination of sound velocity and liquids compressibility
8. Laser-Determination of the wavelength of the laser using grating
   - Determination of the width of the groove of the compact disc using laser.
   - Estimation of laser parameters.
9. Air wedge - Determination of the thickness of a thin sheet/wire
10. a) Optical fibre - Determination of Numerical Aperture and acceptance angle
    b) - Determination of bending loss of fibre.
11. Spectrometer-Determination of the wavelength of light using grating
12. Michelson Interferometer - Determination of wavelength of the monochromatic source of light.
13. Photoelectric effect – Determination of Planck’s constant
14. Black body radiation (Demonstration)
15. Melde’s string experiment - Standing waves.
16. Forced and Damped Oscillations.
17. Thermistor sensor
18. Thermocouple sensor
20. Design LCR series and parallel circuit and estimation of the resonant frequency.
22. Four Probe Set up – determination of band gap/resistivity of a material.

**COURSE OUTCOMES:**

Upon completion of the course, the students will be able

**CO1:** To determine various moduli of elasticity, thermal properties of materials and viscosity of liquids

**CO2:** To determine the velocity of ultrasonic waves in Liquids.

**CO3:** To calculate and analyze various optical properties.

**CO4:** To build and analyze the characteristics of mechanical vibrations and logic operation.

**CO5:** To determine the desired electric and magnetic parameters of materials, semiconductors devices and sensors.

**CO-PO & PSO MAPPING**

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**GE3261**

**ENGLISH LABORATORY – II**

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<td>INTERVIEW IN SOCIAL CONTEXT</td>
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<td>Asking questions and answering - Conducting an interview (of an achiever / survivor) – Role play</td>
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| **UNIT II**     |   |   |   | 6 |
| PERSUASIVE SKILLS |   |   |   | 6 |
| Speaking about specifications of a product (Eg. Home appliances) – Persuasive Talk – Role play activity. |

| **UNIT III**    |   |   |   | 6 |
| CASE STUDY      |   |   |   | 6 |
| Discussions on Case Study to find solutions for problems in professional contexts – Analytical discussion on various aspects of a given problem. |

| **UNIT IV**     |   |   |   | 6 |
| VISUAL INTERPRETATION |   |   |   | 6 |
| Describing visual content (Pictures/Table/Chart) using appropriate descriptive language and making appropriate inferences and giving recommendations. |

| **UNIT V**      |   |   |   | 6 |
| PRESENTATION    |   |   |   | 6 |
| Making presentation with visual component (PPT slides) (job interview / project / innovative product presentation) |

**Assessment**

Internals – 100%

Picture / Graphical description and Interpretation

Formal Presentation with visual tool (like PPT)

**TOTAL : 30 PERIODS**
COURSE OUTCOMES
At the end of the course, students will be able to
CO1: Comprehend and transcode visual content appropriately.
CO2: Participate effectively in formal group discussions.
CO3: Make presentation on a given topic in a formal context.

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